NUS CORPORATION

992 OLD EAGLE SCHOOL ROAD, SUITE 916
WAYNE, PENNSYLVANIA 19087
215-687-9510

ORIGINAL
(Red)

September 13, 1984
R-585-5-4-3
68-01-6699

Mr. Harold Byer
U.S. Environmental Protection Agency
Sixth and Walnut Streets
Philadelphia, PA 19106

Subject: Final Report
TDD No. F3-8305-38
East Richmond Road Landfill Site
Richmond, Virginia

Dear Mr. Byer:

Submitted herewith is a final Site Inspection report for the subject project.

Based on our review of available data, we have concluded that EPA should consider the following:

- The Virginia State Department of Health should forward to EPA copies of all East Richmond Road Landfill Site monitoring well sample analyses, collected as part of the closure plan.

- The sample analyses should be reviewed by EPA. EPA can use this data to determine if the leachate collection system and site closure are effectively controlling the release of contaminants from this site.

- Based on information derived from the monitoring program, a determination can be made as to whether or not further action is necessary at this site.

- Due to the lack of apparent groundwater and surface water targets and no known air release, an HRS has not been completed for this site. Furthermore, the Virginia State Health Department has already approved the closure plan for the site.

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The East Richmond Road Landfill is a 130 acre site (only 50 acres of which were actually used as a landfill) located in the eastern section of the city of Richmond. The landfill was once a sand and gravel quarry, but since 1960 it was used as the city's solid waste disposal site. The landfill site is owned by the city of Richmond, and was open under Solid Waste Management Permit No. 290, issued July 16, 1982, until its closing in September 1983.

NUS FIT III conducted a site inspection on June 8, 1983. FIT III collected aqueous samples from 8 on-site monitoring wells and from ponded water. Sediment samples from 2 leachate seeps were also collected. Various contaminants, including PCB-1260, heavy metals, and phenols were detected.

The site has been closed, capped, and reseeded in accordance with the closure plan established by R. Stuart Royer and Associates, Inc., Engineers. The closure date was September 1983.

If you have any questions, please contact me.

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(b) (6)

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September 13, 1984
R-585-5-4-3
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Mr. Harold Byer
U.S. Environmental Protection Agency
Sixth and Walnut Streets
Philadelphia, PA 19106

Subject: Peer Review Comments
TDD No. F3-8305-38
East Richmond Road Landfill Site
Richmond, Virginia

Dear Mr. Byer:

In response to the peer review comments submitted by EPA for the subject site, the following is offered:

- The Site Inspection Form and text have been corrected to eliminate any inconsistencies.
- The Toxicological Evaluation section of the report has been amended to include information regarding chromium.
- A reference list has been added as appendix D.
- Boring logs and available well logs have been added as appendix E.

If you have any questions, please contact me.

Respectfully submitted, [redacted]

Reviewed by, [redacted]

(b) (6) [redacted]

[redacted]

[redacted]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ORIGINAL (Rcd)

Region III - 6th & Walnut Sts.

Philadelphia, Pa. 19106

SUBJECT: Request Assistance from FIT Office **DATE:** 8/30/84

FROM: Darius Ostrauskas, Darius Ostrauskas
Site Investigation and Support Section(3HW23)

TO: Butch Byer, FIT Coordinator
Site Investigation and Support Section(3HW23)

THRU: for Edmund Skarnolis, Chief
Site Investigation and
Support Section (3HW23)

I. SITE NAME: East Richmond Rd Landfill (VA-157 ~~VA-124~~) DSN

II. LOCATION: Richmond, VA

III. WORK ASSIGNMENT:

___	Preliminary Assessment	___	Quality Assurance Review of Data
X	Site Inspection	___	Re-Sampling/Full Field Investigation
___	Hazard Ranking System	X	Peer Review Corrections
___	Toxicology Assessment	___	Other (See VI below)

IV. PRIORITY:

X High(*) ~~X~~ Medium ___ Low

V. Preferred Deadline:

Date: Sept. 14

VI. EXPLANATION OF TASK (* To include justification for high priority):

Please incorporate attached comments
by M. Plitnik and D. Ostrauskas (3 pgs.)

RECEIVED

1 1984

NUS CORPORATION
REGION III
SENT TO _____

Finalize

VII. To be completed by FIT Coordinator only:

Task complete date by FIT: Sept. 14, 84

Hours allocated: .....

Butch 8/30

PEER REVIEW OF OSWER INFORMATION MATERIALS

(Instructions for the author are on reverse of this sheet)

1. ☑ First Review, ☐ Second Review, ☐ _____

2. Title: SI for East Richmond Rd. LF

3. Contact Person: Name Dawn Ostrander Telephone _____

   Address _____

4. Type of Material and Intended Use: _____

5. Author's Name and Affiliation: NUS / EPA Contractor

6. Date Submitted to Reviewer: _____

7. Reviewer: Name _____ Telephone _____

   Address _____

8. Please review and comment upon the attached information. Your review should identify weal doubtful, ambiguous, or unsupportable statements or conclusions. Feel free to make notation on the materials as well as in the comment space below or on a separate sheet of paper.

   IF YOU ARE UNABLE TO REVIEW AND RETURN THE MATERIALS BY _____ PLEASE CALL THE CONTACT PERSON (see item # 3 above) IMMEDIATELY. Suggestions fo alternate or additional reviewers are always welcome.

Reviewer's Conclusions (check appropriate boxes)

	Acceptable	Questionable	Unacceptabl
Organization and Scope			
Quality of Data			
Presentation of Data			
Validity of Analytical Techniques			
Soundness of Conclusions			
Consistency of Text with Figures, Tables, etc.			

Reviewer's Recommendations (check appropriate boxes)

- ☑ Publish without change
- ☒ Publish with changes noted
- ☐ Do not publish
- ☐ Publish in other media
- ☐ Publish in different format (Journal article, report, A/V etc.)

Reviewer's Comments

See comments by Marilyn Plitnik (2 pgs.) and Dawn Ostrander (1 pg.)

D.O. 8/30/84

[redacted]

(b) (6)

[redacted]

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[redacted]

APPROVED BY

[redacted]

TABLE OF CONTENTS

APPENDICES

SECTION 1

1.0 INTRODUCTION

1.1 Authorization

NUS Corporation performed this work under Environmental Protection Agency Contract No. 68-01-6699. This specific report was prepared in accordance with Technical Directive Document No. F3-8305-38 for the East Richmond Road Landfill located in Richmond, Virginia.

1.2 Scope of Work

NUS FIT III was tasked to perform a site inspection at the East Richmond Road Landfill. Contained herewith are the findings of the site investigation.

1.3 Summary

The East Richmond Road Landfill is a 130 acre site (only 50 acres of which were actually used as landfill) located in the eastern section of the city of Richmond. The landfill was once a sand and gravel quarry, but since 1960 it was used as the city's solid waste disposal site. The landfill site is owned by the city of Richmond, and was operated under Solid Water Management Permit No. 290, issued July 16, 1982, until its closing in September 1983.

The landfill was identified as a hazardous waste site by the city of Richmond's Department of Public Works, in response to the reporting requirements of the Superfund Program (section 103(e)). However, in a letter dated June 8, 1981, and signed by Robert E. Sarver, Director, Department of Public Works, city of Richmond, it was indicated that the city did not knowingly accept anything but non-hazardous mixed municipal wastes. Mr Sarver indicated that through hearsay his department had heard that people in the area had notified EPA that they had disposed of hazardous wastes at the city's landfill disposal sites. Also, a follow-up report to a site inspection performed by Mr. Ken Chestnut of the Virginia State Health Department on July 31, 1978, noted that several hundred gallons of latex were being dumped during the inspection.

According to the October 1981, East Richmond Road Landfill Development Study by R. Stuart Royer and Associates, Inc. and Malcom Pirnie, Inc., a major water source, the Patuxent Aquifer, underlies the entire landfill site and surface outcrops of this aquifer are present at the southwestern corner of the site. The area within the vicinity of the landfill receives water from unaffected public sources. The Patuxent Formation is a regional aquifer which supplies industries, municipal, and residential wells in eastern Virginia. Water within the aquifer originates at its recharge zones (outcroppings), travels eastward along the dip of the formation at approximately 2 to 3 feet per day, and discharges into the Chesapeake Bay and/or Atlantic Ocean. Locally, the Patuxent aquifer outcrops and is partially recharged at the East Richmond Road Landfill

A site inspection was conducted on June 8, 1983, by NUS FIT III. FIT III collected aqueous samples from 8 monitoring wells on site and from ponded water. Sediment samples from 2 leachate seeps were also collected. Various contaminants, including PCB-1260, heavy metals, and phenols were detected.

The site has been closed, capped, and reseeded in accordance with the closure plan established by R. Stuart Royer and Associates, Inc., Engineers. The closure date was September 1983.

SECTION 2

2.0 THE SITE

2.1 Location

The East Richmond Road Landfill is located in the eastern section of the city of Richmond. The site is bounded by East Richmond Road, Jennie Scher Road, 38th Street, 39th Street, Crestview Road, and the Southern Railway.

2.2 Site Layout

During the FIT III inspection, fill operations were restricted to the active fill section. Access to the site was gained by way of East Richmond Road. Structures on site included a scale house at the entrance road and a fenced equipment storage area located on the south side of the entrance road. In September 1983, construction in the unused area ceased and the landfill was capped.

Before the site was used as a solid waste landfill, Gillies Creek traversed it in a northeast-southwest direction. The creek was rechanneled and is confined to a concrete channel that parallels the southern property line.

2.3 Ownership History

The site is owned by the city of Richmond. The city has owned the site since the early 1960s.

2.4 Site Use History

Until the early 1960s, the site was used as a sand and gravel quarry. Since that time the city of Richmond has used the site for solid waste disposal. The site was closed and capped in September 1983. Plans to modify and expand the landfill in an environmentally sound and cost effective manner were discontinued in favor of closing the site.

2.5 Permit and Regulatory Action History

On November 28, 1977, the city of Richmond was granted a non-conforming permit to operate the East Richmond Road Landfill. The permit was issued in order to allow a reasonable amount of time for the city to bring the landfill operation into compliance with the Rules and Regulations of the State Board of Health. On July 16, 1982, a new solid waste management permit (No. 290) for operating a sanitary landfill was issued to the city of Richmond.

The following table summarizes past regulatory activities at the site:

DATE	ACTIVITY	AGENCY	COMMENTS
11/28/77	Non-conforming		
7/31/78	Inspection	VA Dept. of Health	Latex Sludge Disposed Odors Uncovered Wastes
7/17/82	Solid Waste Permit No. 290 Issued		
1/27/83	Preliminary Assessment	NUS FIT III	
6/8/83	Site Inspection	NUS FIT III	
9/83	Site Closed & Capped	City of Richmond	

2.6 Remedial Action To Date

Leachate collection systems and a methane gas collection trench were constructed at the site in the early 1980s. In September 1983, the landfill was closed and capped according to the plan established by R. Stuart Royer and Associates, Inc., dated October 21 and December 14, 1981.

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SECTION 4

ORIGINAL
(Red)

SECTION 3

ORIGINAL
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3.0 ENVIRONMENTAL SETTING

3.1 Surface Waters

Gillies Creek is the major body of surface water at the site. Prior to the landfilling operation, the creek traversed the site from northeast to southwest. Since then, the creek has been rechanneled so that it now borders the southern edge of the property. During periods of flooding, the 100 year floodplain of the Gillies Creek is confined to its channel. Therefore, the state's criterion that no landfill should be located within a 100 year floodplain is met.

3.2 Geology and Soils

The site consists of a sequence of 5 geologic units. From oldest to youngest they are: the Petersburg Formation, the Patuxent Formation, a unit of clayey-silt (Miocene marl), an upper sand and gravel unit, and a recent alluvial deposit.

The Petersburg Formation varies from a granite to a granite-gneiss, and forms the bedrock at depths between 150 and 200 feet below ground elevation.

The Patuxent Formation directly overlies the Petersburg granite and consists of highly permeable sands and gravels interbedded with occasional silt lenses. Regionally, the formation strikes north-south and is exposed as a narrow band of outcrops, oriented north-south. It dips gently to the east beneath a covering of younger sediments and underlies an area within the state of Virginia, of approximately 15,000 square miles. Based on the U.S.G.S. Geologic Map of the Richmond quadrangle, the Patuxent is approximately 100 feet thick, underlies the entire site, and ranges in depth from 100 feet below the surface in the northeastern corner to surface outcrops in the southwestern corner. The outcrop area covers approximately 3 acres.

The clayey-silt unit includes several formations, but all consist of undifferentiated fine grain sediments. Regionally, the clayey-silt unit also strikes north-south, dips gently to the east, and overlies and covers the Patuxent Formation. At the site, it is approximately 55 feet thick, underlies the northern half of the site (based on available logs), and outcrops in the northwest corner. The erosional activity of Gillies Creek has breached the unit, exposing the underlying Patuxent Formation in the southwest corner of the site. The unit's actual extent of cover over the Patuxent is obscured by an overlying deposit of recent alluvium. The outcrop area covers approximately 15 acres.

In the Richmond area, the recent alluvial deposit consists of organic rich, poorly sorted sediments ranging from clay to gravel. At the site, this unit consists of sandy silt, is approximately 10 feet thick, and covers the contact between the Patuxent Formation and the clayey-silt unit. The alluvial deposit covers an area of approximately 30 acres.

The upper sand and gravel unit, on a regional scale, is as extensive as both the Patuxent Formation or the clayey-silt unit. At the site, only a very small piece of this unit is present and is exposed along the northern property line.

Man-Made Zones - The old fill area covers approximately 20 acres and is approximately 20 feet at its maximum depth. The active fill area (used until September 1983) covers 40 acres and is approximately 70 to 100 feet at its maximum depth. The clayey-silt unit underlies both fill areas and forms a partial barrier, separating the fill areas from the Patuxent Formation. A clay cap and reseeded soil cover the fill areas.

3.3 Groundwaters

The Patuxent Formation, the clayey-silt unit, the upper sand and gravel unit, and the recent alluvial deposit are the important hydrogeologic units at the site.

The Patuxent Formation is a regional aquifer, which supplies industrial, municipal, and residential wells in eastern Virginia. Groundwater is not used in the vicinity of the site. Water within the aquifer originates at its recharge zones (outcroppings), travels eastward along the dip of the formation at approximately 2 to 3 feet per day, and discharges into the Chesapeake Bay and/or Atlantic Ocean. Locally, the Patuxent aquifer outcrops and is partially recharged at the landfill.

Due to its inability to transmit large quantities of water (low hydraulic conductivity) and its overlying position, the clayey-silt unit prevents direct recharge of surface water to the aquifer. Recharge, therefore, occurs mainly in areas where the Patuxent outcrops or where overlying soils are thin or permeable. Where the clayey-silt unit is continuous and covers the Patuxent, water within the aquifer is under confined (artesian) conditions. Locally, the clayey-silt unit is discontinous across the site and does not entirely prevent surface water recharge.

The recent alluvial deposit is not considered an aquifer although it is capable of transmitting water. Overall it consists of a range of grain sizes, but at the site the unit is described as sandy silt. Where this unit is in direct contact with the Patuxent Formation it permits suface water recharge to the Patuxent aquifer.

The slope of the topography can be used as an estimate of the direction of local shallow groundwater flow. At the site, prior to the development of the active landfill area, the overall topography sloped down to the south towards Gillies Creek. Therefore, the groundwater flow at the time was generally to the south.

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3.4 Climate and Meteorology

The average annual temperature in Richmond, Virginia is 57.8°F. The coldest month is January with a mean temperature of 37.5°F, and the hottest month is July with a mean temperature of 77.9°F. There are an average of 86 days per year with a temperature below 32°F. The average annual precipitation is 42.59 inches. The highest month of precipitation is July with 5.63 inches; the lowest is April with 2.77 inches. Winds are predominantly out of the south to southwest, except in October and February when the winds are from the north to northeast.

3.5 Land Use

The land surrounding the site is primarily residential. Apartment complexes are located on the northeastern border of the site as well as a short distance to the south. The East Richmond Road Landfill has implemented the closure plan as of September 1983. The site has been capped and seeded. The remainder of the site is bordered by homes or open lots.

3.6 Population Distribution

The population of Richmond, Virgina is 219,429. Approximately 70,000 people live within 93-mile radius of the site. The site is located in a residential area in the eastern section of Richmond.

3.7 Water Supply

The water supply for the landfill area is provided by the city's water filtration plant located on the James River approximately 3 miles west of the site.

3.8 Critical Environments

There are no wetlands or listed endangered species within the vicinity of the site.

4.0 WASTE TYPES AND QUANTITIES

The East Richmond Road site was operated for the purpose of accepting municipal waste from the city of Richmond. However, in response to the reporting requirements of section 103(c) of the Superfund Program, the city of Richmond has indicated that waste from the following sources may have been disposed of at the landfill: construction, textiles, fertilizer, paper/printing, leather tanning, iron/steel foundry, general chemical, plating/polishing, utility companies, sanitary/refuse, photofinish, lab/hospital, and other unknown sources. In completing their report, the city of Richmond was not able to provide what quantities of hazardous waste were possibly disposed of at the site.

SECTION 5

5.0 FIELD TRIP REPORT

5.1 Summary

On Wednesday, June 8, 1983, FIT III staff members William Wentworth, Jeffrey Case, Arthur Weber, and Michael Nalipinski visited the East Richmond Road Landfill in Richmond, Virginia to conduct a site inspection and take samples. The team was on site from 8:45 AM to 4:30 PM. The weather at the time of the inspection was cloudy, with temperatures in the 70s. FIT III collected 8 well samples, a ponded water sample, and sediments from 2 leachate seeps.

5.2 Persons Contacted

5.2.1 Prior to Field Trip

Mr. Michael Corbin, Foreman
East Richmond Road Landfill
3500 East Richmond Road
Richmond, Virginia 23219
(804) 780-6177

Mr. Buddy Palmare, Director
Collection and Disposal
City of Richmond
Richmond, Virginia 23219
(804) 780-6177

5.2.2 At The Site

Mr. Michael Corbin, Foreman
East Richmond Road Landfill
3500 East Richmond Road
Richmond, Virginia 23219
(804) 780-6177

Mr. Buddy Palmare, Director
Collection and Disposal
City of Richmond
Richmond, Virginia 23219
(804) 780-6177

5.4 Site Observations

- FIT III arrived on site on June 8, 1983, at 8:45 AM and were met by Michael Corbin, the site foreman, and Buddy Palmare, Director of Collection and Disposal for the city of Richmond.

- The site was operating, and municipal refuse was being dumped during the site inspection.

- A fenced, equipment storage area is located on the south side of the entrance road.

- A scale house and office are located on the north side of the entrance road.

- A gravel trench for venting methane gas, a few feet wide and approximately 100 feet long, is located in a section on the northeast border of the site.

- Ponded water was observed a short distance north of the access road, before the active areas.

- The old landfill area in the western part of the site was being excavated and used for cover material. The material appeared to be mostly clay and highly decomposed wastes.

- Sections of the leachate control and monitoring systems were observed in the unused portion of the site.

- A 30 inch storm drain was observed in the northwestern corner of the site diverting storm sewer runoff into a shallow ditch which bordered the western side of the old fill area.

- A concrete creek channel, which receives storm water, runs along the southern border of the site.

- The Southern Railway parallels the concrete creek channel a short distance to the south.

TDD Number F3-8305-38
EPA Number VA 124

5.3 SAMPLE LOG

Site Name East Richmond Road Landfill

TRAFFIC REPORTS Organic	TRAFFIC REPORTS Inorganic	TRAFFIC REPORTS High Hazard	SAMPLING LOCATION	PHASE	SAMPLE DESCRIPTION	DATE	TIME	pH	COMMENTS/OBSERVATIONS	LABORATORY
c3232	mc0910		WELL #1	AQ	GROUNDWATER	6/8/83	1600	6.4		ENVIRONMENTAL RESEARCH GROUP
c3233	mc0911		WELL #2	AQ	GROUNDWATER	6/8/83	930	6.2		E.R.G.
c3234	mc0912		WELL #3	AQ	GROUNDWATER	6/8/83	1630	6.6		E.R.G.
c3235	mc0913		WELL #5	AQ	GROUNDWATER	6/8/83	1300	6.4		E.R.G.
c3236	mc0914		WELL #6	AQ	GROUNDWATER	6/8/83	1425	5.6		ERG.
c3237	mc0915		WELL #7	AQ	GROUNDWATER	6/8/83	1335	5.6		E.R.G.
c3238	mc0916		WELL #8	AQ	GROUNDWATER	6/8/83	1400	7.0		E.R.G.
c3240	mc0918		WELL #10	AQ	GROUNDWATER	6/8/83	1530			E.R.G.
c3241	mc0919		PONDED WATER	AQ	SURFACE WATER	6/8/83	1330	7.6		E.R.G.
c3242	mc0920		BLANK	AQ	BLANK	6/8/83	1415	7.2		E.R.G.
c3244	mc0922		LEACHATE #1	SOLID	SURFACE SEDIMENT	6/8/83	1345			E.R.G.
c3245	mc0923		LEACHATE #2	SOLID	SURFACE SEDIMENT	6/8/83	1400			E.R.G.
c3246	mc0924		BLANK	SOLID	BLANK	6/8/83	1415			E.R.G.

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